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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,839	10/29/2003	Yasushi Hattori	Q78107	2503

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EXAMINER	
UHLIR, NIKOLAS J	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,839	HATTORI ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/29/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The examiner has considered the Information Disclosure Statement dated 10/29/03. A signed and initialed copy of this document accompanies this office action.

Claim Objections

3. Claim 5 is objected to because of the following informalities: "Conductive" is misspelled as "conducive" in line two of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The issue with claim 4 is that the applicant requires the conductive layer to be deposited on "an end surface" of the substrate. It is apparent from the language of claims 2-4 that the applicant has tried to differentiate between a surface that is between the substrate and the magnetic layer, a surface that is on the opposite side of the substrate from the magnetic layer, and "an end surface." However, it is not clear from the specification or the claim what an "end surface" encompasses.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-10, 12, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saitoh et al. (US6127039) in view of Murray et al. (US6254662).

8. Claim 1 requires a magnetic recording medium comprising a magnetic layer on at least one side of a nonmagnetic substrate, the magnetic layer containing magnetic particles of a CuAu type or Cu_3Au type ferromagnetic ordered phases, wherein a conductive layer is provided on at least one side of the non-magnetic substrate.

9. Prior to entering into the discussion of the rejection, it is important to discuss how the examiner interprets the instant claims. While the examiner acknowledges that it is his duty to interpret the claims in light of the specification, the examiner also notes that it his duty to give the claims their "broadest reasonable interpretation." Further, while claims are interpreted in light of the specification, limitations from the specification are not read into the claims. With this duty in mind, the examiner interprets "conductive," as used in the instant claims, to simply require a layer that is capable of transmitting electricity.

10. With the above interpretation in mind, Saitoh teaches a magnetic recording medium comprising a non-magnetic base, having on at least one side a non-magnetic base coating (i.e. an underlayer), wherein a magnetic layer is formed on the non-magnetic base coating (column 2, lines 25-35). In addition, the magnetic recording

medium may have a backcoat formed on the side of the substrate opposite the magnetic layer side (column 2, line 55). The non-magnetic base coating includes a resin, a nonmagnetic powder, and a conductive substance (column 9, lines 5-11). The conductive substance is preferably selected from carbon black, SnO_2, and TiO_2 (column 9, lines 60-63). In view of this disclosure, the examiner considers the non-magnetic base coating to be equivalent to applicants claimed conductive layer.

11. Saitoh teaches the use of Fe based magnetic alloy powders in the magnetic layer, including alloys of Fe with Pt (column 11, line 66-column 12, line 21). However, Saitoh doesn't teach a magnetic layer containing CuAu or Cu_3Au type magnetic particles, as required by claim 1.

12. With respect to this deficiency, Murray teaches that a major drive goal in the art of magnetic recording media is increased recording density. In particulate-based media, increase in recording density is typically achieved by reducing the particle size of magnetic particles utilized in the media. However, this approach is limited because of the onset of super-paramagnetic behavior when particles are reduced below a certain size (the specific size depends on the material properties of the magnetic particle) (column 1, lines 15-30). Murray teaches that one effort to mitigate this limitation involves the use of particles having very high magnetocrystalline anisotropy (and thus high coercivity) arising from the presence of ordered intermetallic phases within the particles (column 1, lines 30-39). Murray teaches that FePt binary alloy particles are excellent candidates for this effort (column 1, lines 40-50), and media using these particles exhibit narrower transitions and reduced read back noise (column 1, lines 55-

60). Later Murray describes a method for making monodisperse FePt particles having a CuAu crystal structure (column 2, lines 25-35). Further, Murray teaches depositing these particles on the surface of a substrate, which he notes is an economic route to thin film media (column 2, lines 25-40).

13. Therefore it would have been obvious to one of ordinary skill in the art to substitute the FePt CuAu type particles taught by Murray for the Fe based magnetic particles taught by Saitoh.

14. One would have been motivated to make this modification in view of the teachings of Murray, which states that magnetic recording media using FePt CuAu type magnetic layers exhibit narrower transitions and higher read output, and the fact that Saitoh explicitly teaches that Fe based alloy particles, including FePt particles, are suitable for use as the magnetic particles in the magnetic layer.

15. Claim 2 is met as set forth above.

16. Claim 3 requires the conductive layer to be on a side opposite to that of the magnetic layer. The examiner takes the position that the backcoat of Saitoh as modified by Murray meets this limitation. The backcoat is specifically taught to contain carbon black for the purpose of improving an antistatic effect (column 15, lines 40-53). Given that carbon black is know to be conductive an d the fact that the backcoat serves as an antistatic film, the examiner considers the backcoat to be equivalent to applicants claimed conductive coating on the side of the substrate opposite that of the magnetic layer.

17. Claim 4 requires the conductive layer to be formed on an end surface of the substrate. Once again noting the examiners burden to give the claims their broadest reasonable interpretation, the examiner interprets "end surface" as being any terminating portion of the substrate. Further, the examiner does not interpret "an end surface" as requiring "only" the end surface to be coated. Given this interpretation, claim 4 is met as set forth above for claims 1 or 3, as the conductive underlayer/backcoat are both disposed on the entire front and back surface of the media. Thus, they are on "an end surface" in the sense that they are formed on a terminating surface of the media. Further, the conductive underlayer and backcoat are formed on the entire front and back surfaces of the media, so they must necessarily at some point be in contact with "an end surface" of the media.

18. Claim 5 is met as set forth above for claim 1.

19. Claim 6 requires specific conductive particles. Saitoh teaches that the conductive particles can be ZnO, MgO, SnO_2, titanium oxide, carbon black, corundum (equivalent to Al_2O_3) and other materials (column 9, lines 10-20). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to select ZnO, MgO, SnO_2, titanium oxide, or corundum as the material for the conductive particles in Saitoh, as Saitoh recognizes the equivalence of these materials to the others listed as suitable.

20. Claim 7 is met as set forth above for claim 6. Though Saitoh does not explicitly teach the volume resistivity of the conductive particles in the conductive layer, the conductive particles used in Saitoh are listed in the instant specification as possessing

the required volume resistivity. Thus, the examiner takes the position that this limitation is met.

21. Claim 8 requires the conductive layer to contain carbon black. Saitoh teaches that the conductive particles in the conductive layer can be carbon black (column 9, lines 11-20).

22. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize carbon black as the conductive particles in Saitoh, as Saitoh recognizes the equivalence of Carbon black to the other materials listed as suitable.

23. Claims 9 and 10 requires the carbon black to have specific SBET and DBP properties. Saitoh teaches that the conductive particles (which can be carbon black) should have a specific surface area (BET method; considered to be equivalent to claimed SBET method), of 25-150 m^2/g, and a DBP oil absorption of preferably 30-80 ml/g (column 9, lines 35-45).

24. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize carbon black with a specific surface area (BET method) of 25-150 m^2/g, and a DBP oil absorption of preferably 30-80 ml/g as the conductive particles in Saitoh, as Saitoh recognizes the equivalence of Carbon black to the other materials listed as suitable, and specifically teaches that the conductive particles should have these BET and DBO characteristics.

25. Claim 12 requires the conductive layer to be 10-700nm thick. Saitoh teaches that the nonmagnetic base layer is suitably 0.5-3μm thick (column 16, lines 50-55).

26. Therefore it would have been obvious to one of ordinary skill in the art to form the non-magnetic base coating of Saitoh to thickness of 0.5μ (500nm), as Saitoh explicitly teaches that this thickness is suitable.

27. Claim 14 is met as set forth above for claim 1.

28. Claim 15 requires a protection film on the magnetic layer. Saitoh teaches forming a lubricant layer of a DLC (diamond like carbon) film over the magnetic layer (column 16, lines 30-35). These layers are specifically taught to function as protective layers.

29. Claims 1, 3-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al. (JP04005212) in view of Murray et al.

30. For the purpose of this examination the examiner has relied on the abstract of the Yanai reference to support the examiners position.

31. Regarding claim 1, Yanai teaches a magnetic recording medium comprising a substrate, a magnetic layer comprising magnetic particles on one side of the substrate, and a conductive polymer compound on the other side of the substrate (abstract).

32. Yanai doesn't teach a recording medium utilizing CuAu or $CuAu_3$ particles, as required by claim 1.

33. However, Murray teaches that a major drive goal in the art of magnetic recording media is increased recording density. In particulate-based media, increase in recording density is typically achieved by reducing the particle size of magnetic particles utilized in the media. However, this approach is limited because of the onset of super-paramagnetic behavior when particles are reduced below a certain size (the specific size depends on the material properties of the magnetic particle) (column 1, lines 15-

30). Murray teaches that one effort to mitigate this limitation involves the use of particles having very high magnetocrystalline anisotropy (and thus high coercivity) arising from the presence of ordered intermetallic phases within the particles (column 1, lines 30-39). Murray teaches that FePt binary alloy particles are excellent candidates for this effort (column 1, lines 40-50), and media using these particles exhibit narrower transitions and reduced read back noise (column 1, lines 55-60). Later Murray describes a method for making monodisperse FePt particles having a CuAu crystal structure (column 2, lines 25-35). Further, Murray teaches depositing these particles on the surface of a substrate, which he notes is an economic route to thin film media (column 2, lines 25-40).

34. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the particle taught by Murray as the magnetic particles in the Yanai.

35. One would have been motivated to make this modification in view of the fact that Murray teaches that media utilizing these particles exhibit narrower transitions and lower read back noise, and are economical.

36. Claims 3 and 4 are met as set forth above. The conductive polymer layer is equivalent to applicants claimed conductive layer, and it is formed on the surface of the substrate opposite the magnetic layer. This surface is considered by the examiner to be equivalent to applicants "an end surface," required by claim 4.

37. Claim 11 is met as set forth above for claim 1.

38. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Saitoh as modified by Murray above, and further in view of Ushigome (US5523153).

39. Saitoh as modified by Murray above fails to teach the surface electric resistance of required by claim 13. However, it is noted that in addition to magnetic particles, Saitoh teaches that the magnetic layer can also contain carbon black (column 14, lines 45-48)

40. Further, Ushigome teaches that it is known in the art of magnetic recording media that the reliability of the media is negatively impacted by dust adhering to the surface of the media. When the magnetic layer has a high surface electric resistance, the magnetic layer is easily charged and dust readily adheres to its surface. To increase the reliability of the media, the surface electric resistance of the media should be smaller than $5*10^7$ Ω/□ (column 1, lines 20-35). This can be accomplished by controlling the amount of carbon black in the magnetic layer (column 1, lines 20-35).

41. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the amount of carbon black in the magnetic layer of Saitoh as modified by Murray so as to obtain a surface electric resistance of less than $5*10^7$ Ω/□.

42. One would have been motivated to make this modification in view of the teaching in Ushigome that the reliability of the media is improved by controlling the surface electric resistance to a value below $5*10^7$ Ω/□.

Citation of Pertinent Prior Art

43. The examiner hereby cites US5876824 as a pertinent prior art document to the instant application. Though not relied upon in this office action, this reference teaches a magnetic recording medium having a backcoat, an undercoat, and a magnetic layer, and teachers the use of identical carbon black as that disclosed by the applicant in the instant specification.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nju

D. S. NAKARANI
PRIMARY EXAMINER